

# Strategic voting and social welfare rules

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# Valorisation

“What do you study, *exactly*?” is a question I heard many times, mostly from friends who are outside of the academia. While there is no easy answer to this question, I considered finding a close enough one is a challenge myself. In general, this thesis is in the field of social choice theory. Though, as soon as I mention the word “elections” everyone is so keen to finalize the explanation I started by guessing. “So, you collect election data and check some patterns and such?” I reply to those with saying some people also study things like that. But...

But what exactly I do? It is somehow easier to understand what does the political theorists do, what commentators do, what policy advisors do etc. Except the first one, they work with a given system, evaluate how things could be done better, using some existing tools to solve contemporary problems. In contrast to this, political theorists, philosophers try to understand the procedure. They not only define and observe the structure but also put things into a historical framework. By putting some distance between themselves and the reality, they are able to criticize and present alternatives. That is why I consider social choice theorists as a kind of philosophers.

While generally philosophers use history of thought, analogies between concepts and events, social choice theorists use the intricacies of mathematical objects to understand the underlying properties. While abstraction is always useful to seek alternatives, in this case, it already is included in the tool we use, mathematics. When it comes to elections, there are many criteria one would be interested in. It would be reasonable to assume that if there is an election

system that encapsulates all, it has to be shown in a rigorous way. If there is not, this impossibility must be shown in a such a way that, there will not be any efforts wasted on the intersection of some ideals. Social choice is interested in both of these, most of its results are either characterizations which define things in the most concise way, or impossibilities that shows an incompatibility between different criteria.

As already discussed, this thesis in its total follows the discipline of social choice theory. So going over the chapters to summarize what has been done will be exemplifying the general picture. The first chapter is actually motivated by the civil war in Syria. Many of the proposed solutions to the crisis included gathering up a delegation to discuss what should be done, and how the different agents in Syrian society can compromise. This was all before most of the bloodshed, we hoped that this diplomatic procedure could at least ease the crisis a bit. While the events afterward proved us utterly wrong, our work tried to help this, or other procedures like this to pick a delegation in a neutral way, that is, it should be based on reasonable principles without implying any implicit advantage for any of the opinions to be summed up. How did we construct these reasonable principles could be found in Chapter 2. Our result implies that while there might be societies in which excluding some minorities from the delegation may work, but for most of the time, we should invite everyone to the table for a discussion that will be fruitful.

Chapter 3 mainly focuses on another important principle. It is called Participation Criterion, and it makes sure that no voter will be better off by abstaining, instead of voting. This is a formalization of a problem that is more visible in real life. First, there are non zero costs for voting, at least by walking into the building that everyone votes. Second, the probability that vote of someone affecting the outcome of the election is pretty small. So, there will be some people that will weight this “cost” against the benefit of positively affecting the result of the election, and decide not to vote. Even excluding such possibilities, there is the problem of possibly affecting the outcome in a negative way for themselves. While voting for their best candidate, in some election systems, you can easily make your worst candidate win, which is another cost that will be only visible ex-post, once the votes have been counted.

The importance of this principle comes from the fact that democracy is by definition a concept people should participate in. Trusting the wisdom of the crowd is not possible if no one is willing to voice their opinion. Thus, trying to analyze election systems, in which no one could make the outcome worse off for them at least, is an attempt to help the survival of democracy.

Finally the last chapter is about distances. In social choice theory, people are assumed to minimize some distance when preferring one ruler over the other. These distances has similar properties with distances between places, for example, just as Amsterdam is as close to Maastricht as Maastricht is close to Amsterdam, a ruler and a citizen are assumed to be equidistant from each other. In this last chapter, together with this property called symmetry, some other properties of metrics are analyzed, whether they are reasonable to expect in a setting where rulers are decision makers in an uncertain world. Intuitively, the effort is parallel to the concept of “social distance” from psychology which also is analyzed within other fields of economics. The result may be both useful for understanding the voter behavior better, which would help decision makers to be more informed about expectations.